



Boron removal from seawater using date palm (*Phoenix dactylifera*) seed ash

Mansour Al.Haddabi^{a,b}, Mushtaque Ahmed^{b,*}, Zainab Al.Jebri^b, Hari Vuthaluru^a, Hussein Znad^a, Mohammed Al.Kindi^c

^aSchool of Chemical and Petroleum Engineering, Curtin University, GPO Box U1987, Perth WA 6845, Australia, Tel. +968 99333976; email: mans99@squ.edu.om (M. Al.Haddabi), Tel. +618 9266 4685; email: H.Vuthaluru@curtin.edu.au (H. Vuthaluru), Tel. +618 9266 9893; email: H.Znad@curtin.edu.au (H. Znad)

^bDepartment of Soils, Water and Agricultural Engineering, College of Agricultural and Marine Sciences, Sultan Qaboos University, PO Box 34, Al-Khod 123, Sultanate of Oman, Tel. +968 92171834, email: ahmedm@squ.edu.om (M. Ahmed) Tel. +968 96214289; email: aljebrizainab@gmail.com (Z. Al.Jebri)

^cDepartment of Pathology, College of Medicine and Health Sciences, Sultan Qaboos University, PO Box 35, Al-Khod 123, Sultanate of Oman, Tel. +968 99209258; email: alkindi2@squ.edu.om

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ABSTRACT

The feasibility of date seed ash, a low-cost agricultural by-product in Oman, for the removal of boron from aqueous solution was investigated. The aim of this study was to understand the mechanism that governs boron removal from seawater using date seed ash as an adsorbent in batch adsorption experiments. The effects of adsorbent dose, contact time, and temperature on boron removal were tested. A surface study of the date seed ash was investigated using scanning electron microscope, energy-dispersive X-ray spectroscopy, and Fourier transform infrared. Thermogravimetric-analysis, specific area using Brunauer, Emmett and Teller method, and particle density were also obtained. The maximum removal efficiency of boron was around 47% at neutral pH. The application of date seed ash is a promising adsorbent for boron removal where it can be used as pretreatment before reverse osmosis desalination process. This will increase the stability of membranes, minimize the membrane scaling, and ultimately reduce the operating cost.

Keywords: Boron; Date seed ash; Adsorbent

*Corresponding author.